

SEQUENCE LISTING

<110> Jander, Georg

Baerson, Scott R

Durrett, Timothy P

<120> Plants with Imidazolinone-Resistant ALS

<130> 38-10(15820)B

<150> US 60/257,480

<151> 2000-12-21

<160> 38

<170> PatentIn version 3.1

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Ala	Phe	Gly	Val	Arg	Phe	Asp	Asp	Arg	Val	Thr	Gly	Lys	Leu	Glu	Ala				
	370					375					380								
Phe	Ala	Ser	Arg	Ala	Lys	Ile	Val	His	Ile	Asp	Ile	Asp	Ser	Ala	Glu				
385					390					395					400				
Ile	Gly	Lys	Asn	Lys	Thr	Pro	His	Val	Ser	Val	Cys	Gly	Asp	Val	Lys				
			405						410					415					

Leu Ala Leu Gln Gly Met Asn Lys Val Leu Glu Asn Arg Ala Glu Glu
 420 425 430
 Leu Lys Leu Asp Phe Gly Val Trp Arg Asn Glu Leu Asn Val Gln Lys
 435 440 445
 Gln Lys Phe Pro Leu Ser Phe Lys Thr Phe Gly Glu Ala Ile Pro Pro
 450 455 460
 Gln Tyr Ala Ile Lys Val Leu Asp Glu Leu Thr Asp Gly Lys Ala Ile
 465 470 475 480
 Ile Ser Thr Gly Val Gly Gln His Gln Met Trp Ala Ala Gln Phe Tyr
 485 490 495
 Asn Tyr Lys Lys Pro Arg Gln Trp Leu Ser Ser Gly Gly Leu Gly Ala
 500 505 510
 Met Gly Phe Gly Leu Pro Ala Ala Ile Gly Ala Ser Val Ala Asn Pro
 515 520 525
 Asp Ala Ile Val Val Asp Ile Asp Gly Asp Gly Ser Phe Ile Met Asn
 530 535 540
 Val Gln Glu Leu Ala Thr Ile Arg Val Glu Asn Leu Pro Val Lys Val
 545 550 555 560
 Leu Leu Leu Asn Asn Gln His Leu Gly Met Val Met Gln Trp Glu Asp
 565 570 575
 Arg Phe Tyr Lys Ala Asn Arg Ala His Thr Phe Leu Gly Asp Pro Ala
 580 585 590
 Gln Glu Asp Glu Ile Phe Pro Asn Met Leu Leu Phe Ala Ala Ala Cys
 595 600 605
 Gly Ile Pro Ala Ala Arg Val Thr Lys Lys Ala Asp Leu Arg Glu Ala
 610 615 620
 Ile Gln Thr Met Leu Asp Thr Pro Gly Pro Tyr Leu Leu Asp Val Ile
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 645 650 655
 Phe Asn Asp Val Ile Thr Glu Gly Asp Gly Arg Ile Lys Tyr
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<211> 670

<212> PRT

<213> Arabidopsis thaliana ecotype Columbia

<400> 4

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Arg Phe Ser Leu Pro Phe Ser Leu Asn Pro Asn Lys Ser Ser Ser Ser
35 40 45
Ser Arg Arg Arg Gly Ile Lys Ser Ser Ser Pro Ser Ser Ile Ser Ala
50 55 60
Val Leu Asn Thr Thr Thr Asn Val Thr Thr Thr Pro Ser Pro Thr Lys
65 70 75 80
Pro Thr Lys Pro Glu Thr Phe Ile Ser Arg Phe Ala Pro Asp Gln Pro
85 90 95
Arg Lys Gly Ala Asp Ile Leu Val Glu Ala Leu Glu Arg Gln Gly Val
100 105 110
Glu Thr Val Phe Ala Tyr Pro Gly Gly Ala Ser Met Glu Ile His Gln
115 120 125
Ala Leu Thr Arg Ser Ser Ser Ile Arg Asn Val Leu Pro Arg His Glu
130 135 140
Gln Gly Gly Val Phe Ala Ala Glu Gly Tyr Ala Arg Ser Ser Gly Lys
145 150 155 160
Pro Gly Ile Cys Ile Ala Thr Ser Gly Pro Gly Ala Thr Asn Leu Val
165 170 175
Ser Gly Leu Ala Asp Ala Leu Leu Asp Ser Val Pro Leu Val Ala Ile
180 185 190
Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Val Phe Gln Glu
195 200 205
Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys His Asn Tyr Leu
210 215 220
Val Met Asp Val Glu Asp Ile Pro Arg Ile Ile Glu Glu Ala Phe Phe
225 230 235 240
Leu Ala Thr Ser Gly Arg Pro Gly Pro Val Leu Val Asp Val Pro Lys
245 250 255
Asp Ile Gln Gln Gln Leu Ala Ile Pro Asn Trp Glu Gln Ala Met Arg
260 265 270
Leu Pro Gly Tyr Met Ser Arg Met Pro Lys Pro Pro Glu Asp Ser His
275 280 285

Leu Glu Gln Ile Val Arg Leu Ile Ser Glu Ser Lys Lys Pro Val Leu
 290 295 300
 Tyr Val Gly Gly Gly Cys Leu Asn Ser Ser Asp Glu Leu Gly Arg Phe
 305 310 315 320
 Val Glu Leu Thr Gly Ile Pro Val Ala Ser Thr Leu Met Gly Leu Gly
 325 330 335
 Ser Tyr Pro Cys Asp Asp Glu Leu Ser Leu His Met Leu Gly Met His
 340 345 350
 Gly Thr Val Tyr Ala Asn Tyr Ala Val Glu His Ser Asp Leu Leu Leu
 355 360 365
 Ala Phe Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys Leu Glu Ala
 370 375 380
 Phe Ala Ser Arg Ala Lys Ile Val His Ile Asp Ile Asp Ser Ala Glu
 385 390 395 400
 Ile Gly Lys Asn Lys Thr Pro His Val Ser Val Cys Gly Asp Val Lys
 405 410 415
 Leu Ala Leu Gln Gly Met Asn Lys Val Leu Glu Asn Arg Ala Glu Glu
 420 425 430
 Leu Lys Leu Asp Phe Gly Val Trp Arg Asn Glu Leu Asn Val Gln Lys
 435 440 445
 Gln Lys Phe Pro Leu Ser Phe Lys Thr Phe Gly Glu Ala Ile Pro Pro
 450 455 460
 Gln Tyr Ala Ile Lys Val Leu Asp Glu Leu Thr Asp Gly Lys Ala Ile
 465 470 475 480
 Ile Ser Thr Gly Val Gly Gln His Gln Met Trp Ala Ala Gln Phe Tyr
 485 490 495
 Asn Tyr Lys Lys Pro Arg Gln Trp Leu Ser Ser Gly Gly Leu Gly Ala
 500 505 510
 Met Gly Phe Gly Leu Pro Ala Ala Ile Gly Ala Ser Val Ala Asn Pro
 515 520 525
 Asp Ala Ile Val Val Asp Ile Asp Gly Asp Gly Ser Phe Ile Met Asn
 530 535 540
 Val Gln Glu Leu Ala Thr Ile Arg Val Glu Asn Leu Pro Val Lys Val
 545 550 555 560
 Leu Leu Leu Asn Asn Gln His Leu Gly Met Val Met Gln Trp Glu Asp
 565 570 575
 Arg Phe Tyr Lys Ala Asn Arg Ala His Thr Phe Leu Gly Asp Pro Ala

580	585	590
Gln Glu Asp Glu Ile Phe Pro Asn Met Leu Leu Phe Ala Ala Ala Cys		
595	600	605
Gly Ile Pro Ala Ala Arg Val Thr Lys Lys Ala Asp Leu Arg Glu Ala		
610	615	620
Ile Gln Thr Met Leu Asp Thr Pro Gly Pro Tyr Leu Leu Asp Val Ile		
625	630	635
Cys Pro His Gln Glu His Val Leu Pro Met Ile Pro Ser Gly Gly Thr		
645	650	655
Phe Asn Asp Val Ile Thr Glu Gly Asp Gly Arg Ile Lys Tyr		
660	665	670

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<213> Arabidopsis thaliana

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38

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<211> 38

<212> DNA

<213> Arabidopsis thaliana

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<212> DNA

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38

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tgtaaaacga cggccagtgt gctcaacaca accaccaa

38

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38

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<212> DNA

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<400> 12

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<210> 13

<211> 38

<212> DNA

<213> Arabidopsis thaliana

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<210> 14

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<213> Arabidopsis thaliana

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<213> Arabidopsis thaliana

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38

<210> 16

<211> 38

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<213> Arabidopsis thaliana

<400> 16

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<210> 19

<211> 38

<212> DNA

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<210> 22

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<211> 50

<212> DNA

<213> Arabidopsis thaliana

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<213> *Arabidopsis thaliana*

<400> 24

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44

<210> 25

<211> 2013

<212> DNA

<213> *Arabidopsis thaliana* ecotype Landsberg erecta

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aacccaaca aatcatcctc ctctctccgc cgccgcggta tcaaattccag ctctccctcc	180
tccatctccg ccgtgctcaa cacaaccacc aatgtcacia ccactccttc tccaacaaaa	240
cctaccaaac ccgaaacatt catctcccga ttcgctccag atcaaccccg caaaggcgct	300
gatatcctcg tcgaagcttt agaacgtcaa ggcgtagaaa ccgtattcgc ttaccctgga	360
ggtgcatcaa tggagattca ccaagcctta acccgctctt cctcaatccg taacgtcctt	420
cctcgtcagc aacaaggagg tgtattcgca gcagaaggat acgctcgatc ctgaggtaaa	480
ccaggatatc gtatagccac ttcagggtccc ggagctacaa atctcgttag cggattagcc	540
gatgcgttgt tagatagtgt tcctcttgta gcaatcacag gacaagtccc tcgctgtagt	600
attggtacag atgtgtttca agagactccg attggtgagg taacgcgttc gattacgaag	660
cataactatc ttgtgatgga tgttgaagat atccctagga ttattgagga agctttcttt	720
ttagctactt ctggtagacc tggacctgtt ttgggtgatg ttcctaaaga tattcaacaa	780
cagcttgcca ttcctaattg ggaacaggct atgagattac ctggttatat gtctaggatg	840
cctaaacctc cggaagattc tcatttgagc cagattgtta ggttgatttc tgagtctaag	900
aagcctgtgt tgtatgttgg tgggtggtgt ttgaattcta gcgatgaatt gggtaggttt	960
gttgagctta cggggatccc tgttgcgagt acgttgatgg ggctgggata ttatccttgt	1020
gatgatgagt tgtcgttaca tatgcttggg atgcatggga cgggtgatgc gaattacgct	1080
gtggagcata gtgatttgtt gttggcgttt ggggtgaggt ttgatgatcg cgtcacgggt	1140

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<210> 26

<211> 670

<212> PRT

<213> Arabidopsis thaliana ecotype Landsberg erecta

<400> 26

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20 25 30

Arg Phe Ser Leu Pro Phe Ser Leu Asn Pro Asn Lys Ser Ser Ser Ser
35 40 45

Ser Arg Arg Arg Gly Ile Lys Ser Ser Ser Pro Ser Ser Ile Ser Ala
50 55 60

Val Leu Asn Thr Thr Thr Asn Val Thr Thr Thr Pro Ser Pro Thr Lys

65		70		75		80
Pro Thr Lys Pro	Glu Thr Phe Ile Ser Arg Phe Ala Pro Asp Gln Pro					
	85		90		95	
Arg Lys Gly Ala Asp Ile Leu Val	Glu Ala Leu Glu Arg Gln Gly Val					
	100		105		110	
Glu Thr Val Phe Ala Tyr Pro	Gly Gly Ala Ser Met Glu Ile His Gln					
	115		120		125	
Ala Leu Thr Arg Ser Ser Ser Ile Arg Asn Val	Leu Pro Arg His Glu					
	130		135		140	
Gln Gly Gly Val Phe Ala Ala Glu Gly Tyr Ala Arg Ser Ser Gly Lys						
	145		150		155	160
Pro Gly Ile Cys Ile Ala Thr Ser Gly Pro Gly Ala Thr Asn Leu Val						
	165		170		175	
Ser Gly Leu Ala Asp Ala Leu Leu Asp Ser Val Pro Leu Val Ala Ile						
	180		185		190	
Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Val Phe Gln Glu						
	195		200		205	
Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys His Asn Tyr Leu						
	210		215		220	
Val Met Asp Val Glu Asp Ile Pro Arg Ile Ile Glu Glu Ala Phe Phe						
	225		230		235	240
Leu Ala Thr Ser Gly Arg Pro Gly Pro Val Leu Val Asp Val Pro Lys						
	245		250		255	
Asp Ile Gln Gln Gln Leu Ala Ile Pro Asn Trp Glu Gln Ala Met Arg						
	260		265		270	
Leu Pro Gly Tyr Met Ser Arg Met Pro Lys Pro Pro Glu Asp Ser His						
	275		280		285	
Leu Glu Gln Ile Val Arg Leu Ile Ser Glu Ser Lys Lys Pro Val Leu						
	290		295		300	
Tyr Val Gly Gly Gly Cys Leu Asn Ser Ser Asp Glu Leu Gly Arg Phe						
	305		310		315	320
Val Glu Leu Thr Gly Ile Pro Val Ala Ser Thr Leu Met Gly Leu Gly						
	325		330		335	
Ser Tyr Pro Cys Asp Asp Glu Leu Ser Leu His Met Leu Gly Met His						
	340		345		350	
Gly Thr Val Tyr Ala Asn Tyr Ala Val Glu His Ser Asp Leu Leu Leu						
	355		360		365	
Ala Phe Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys Leu Glu Ala						

370	375	380
Phe Ala Ser Arg Ala Lys Ile Val His Ile Asp Ile Asp Ser Ala Glu 385 390 395 400		
Ile Gly Lys Asn Lys Thr Pro His Val Ser Val Cys Gly Asp Val Lys 405 410 415		
Leu Ala Leu Gln Gly Met Asn Lys Val Leu Glu Asn Arg Ala Glu Glu 420 425 430		
Leu Lys Leu Asp Phe Gly Val Trp Arg Asn Glu Leu Asn Val Gln Lys 435 440 445		
Gln Lys Phe Pro Leu Ser Phe Lys Thr Phe Gly Glu Ala Ile Pro Pro 450 455 460		
Gln Tyr Ala Ile Lys Val Leu Asp Glu Leu Thr Asp Gly Lys Ala Ile 465 470 475 480		
Ile Ser Thr Gly Val Gly Gln His Gln Met Trp Ala Ala Gln Phe Tyr 485 490 495		
Asn Tyr Lys Lys Pro Arg Gln Trp Leu Ser Ser Gly Gly Leu Gly Ala 500 505 510		
Met Gly Phe Gly Leu Pro Ala Ala Ile Gly Ala Ser Val Ala Asn Pro 515 520 525		
Asp Ala Ile Val Val Asp Ile Asp Gly Asp Gly Ser Phe Ile Met Asn 530 535 540		
Val Gln Glu Leu Ala Thr Ile Arg Val Glu Gln Leu Pro Val Lys Ile 545 550 555 560		
Leu Leu Leu Asn Asn Gln His Leu Gly Met Val Met Gln Trp Glu Asp 565 570 575		
Arg Phe Tyr Lys Ala Asn Arg Ala His Thr Phe Leu Gly Asp Pro Ala 580 585 590		
Gln Glu Asp Glu Ile Phe Pro Asn Met Leu Leu Phe Ala Ala Ala Cys 595 600 605		
Gly Ile Pro Ala Ala Arg Val Thr Lys Lys Ala Asp Leu Arg Glu Ala 610 615 620		
Ile Gln Thr Met Leu Asp Thr Pro Gly Pro Tyr Leu Leu Asp Val Ile 625 630 635 640		
Cys Pro His Gln Glu His Val Leu Pro Met Ile Pro Ser Gly Gly Thr 645 650 655		
Phe Asn Asp Val Ile Thr Glu Gly Asp Gly Arg Ile Lys Tyr 660 665 670		

<210> 27

<211> 31

<212> PRT

<213> Arabidopsis thaliana

<400> 27

Leu Glu Arg Gln Gly Val Glu Thr Val Phe Ala Tyr Pro Gly Gly Ala
1 5 10 15

Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Ser Ser Ile Arg
20 25 30

<210> 28

<211> 31

<212> PRT

<213> Brassica napus

<400> 28

Leu Glu Arg Gln Gly Val Glu Thr Val Phe Ala Tyr Pro Gly Gly Ala
1 5 10 15

Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Ser Thr Ile Arg
20 25 30

<210> 29

<211> 31

<212> PRT

<213> Gossypium hirsutum

<400> 29

Leu Glu Arg Glu Gly Val Lys Asp Val Phe Ala Tyr Pro Gly Gly Ala
1 5 10 15

Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Lys Ile Ile Arg

20

25

30

<210> 30

<211> 31

<212> PRT

<213> Nicotiana tabacum

<400> 30

Leu Glu Arg Glu Gly Val Lys Asp Val Phe Ala Tyr Pro Gly Gly Ala
 1 5 10 15

Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Lys Ile Ile Arg
 20 25 30

<210> 31

<211> 31

<212> PRT

<213> Glycine max

<400> 31

Leu Glu Arg Gln Gly Val Thr Asp Val Phe Ala Tyr Pro Gly Gly Ala
 1 5 10 15

Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Ser Ser Ile Arg
 20 25 30

<210> 32

<211> 31

<212> PRT

<213> Zea mays

<400> 32

Leu Glu Arg Cys Gly Val Arg Asp Val Phe Ala Tyr Pro Gly Gly Ala
 1 5 10 15

Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Pro Val Ile Ala
 20 25 30

<210> 33

<211> 31

<212> PRT

<213> Arabidopsis thaliana

<400> 33

Val Ala Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala
 1 5 10 15

Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys
 20 25 30

<210> 34

<211> 31

<212> PRT

<213> Brassica napus

<400> 34

Val Ala Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala
 1 5 10 15

Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys
 20 25 30

<210> 35

<211> 31

<212> PRT

<213> Gossypium hirsutum

<400> 35

Val Ala Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala
 1 5 10 15

Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys
 20 25 30

<210> 36

<211> 31

<212> PRT

<213> Nicotiana tabacum

<400> 36

Val Ala Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala
 1 5 10 15

Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys
 20 25 30

<210> 37

<211> 31

<212> PRT

<213> Glycine max

<400> 37

Val Ala Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala
 1 5 10 15

Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys
 20 25 30

<210> 38

<211> 31

<212> PRT

<213> Zea mays

<400> 38

Val Ala Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala
1 5 10 15

Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys
20 25 30

Val Ala Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala
1 5 10 15
Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys
20 25 30